

NightStar Technical Specs

Applicable to all NightStars, except as noted

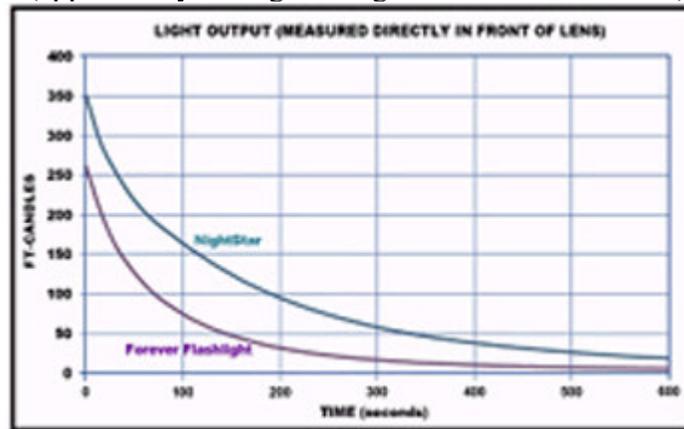
- Polycarbonate, waterproof housing - Tough enough to take extreme/repeated impacts
- Bright white LED - rated for 100,000 hours of operation drawing up to 5.4 Volts (NightStar CS series rated for 50,000 hours).
- Charging magnet - core strength of 30 million Gauss with a surface strength of 5200 Gauss (NightStar CS is smaller - contact us for exact figures).
- Wire Coil - coil that the magnet passed through to generate electricity
- 1 Farad 5.5 Volt capacitor - holds the charge generated by passing the magnet through the coil
- Glow-in-the-dark switches - allows the *NightStar* to be turned on and off without penetrating the waterproof housing
- Plastic lens - focuses and concentrates the light from the LED

Size and Operating conditions

Temperature:	Storage: -50°F (-45°C) to +140°F (60°C) Operation: -40°F (-40°C) to +130°F (55°C)
Pressure:	Operational at an ocean depth of 180 ft. (55m) Performance unaffected after being driven over by 4 x 4 truck on concrete surface.
Chemical Resistance:	Unaffected by salt water, alcohol, and ammonia based cleaners. Dissolve resistant against medium strength acids.
Shock:	Fully functional after repeated random drops from a height of 6 ft (2m) onto a concrete surface.
Weight / Mass:	NightStar: 14 ounces / 390 grams NightStar CS:
Size:	NightStar 11" (28cm) long x 2.5" (7cm) diameter (max) NightStar CS

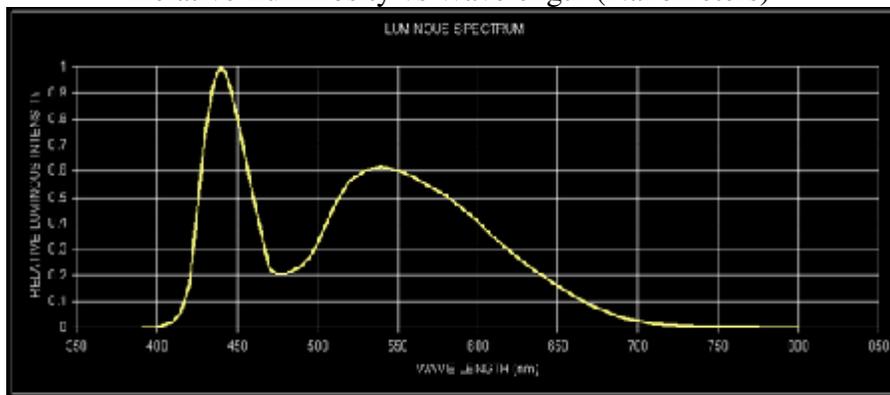
Light Output vs Time for the *NightStar*

and another kinetic flashlight
Foot Candles vs Seconds
(applies only to original NightStar with white LED)



Scale: 0-400 Foot candles vs 0-600 seconds

Light Spectrum of the white LED *NightStars*
Relative Luminosity vs Wavelength (Nanometers)



Scale: 0-1 Relative Luminosity vs 350-850 Nanometers

ShakeLight NightStar LED Flashlight

Gadgeteer Hands On Review by [Judie Hughes](#)

May 13, 2005

Several months ago, I reviewed an LED torch that was powered by the [Faraday Principle](#). As much as I like the idea of battery-free lighting and as much as I wanted to be able to recommend it, the [performance](#) of the [Forever Flashlight](#) was underwhelming - to say the least. Thankfully, one of our readers emailed and made me aware of a product that I should try before completely dismissing the idea of power created by repeatedly passing a magnet through a copper coil. Upon his recommendation, I visited the [Shake Light](#) site and found that they did indeed offer a similar product to the one I had previously tried.

Looking at ShakeLight's [pictures](#) and reading their [technical specifications](#), I could see that their [NightStar LED Flashlight](#) was definitely a more substantial and perhaps better quality torch than the brand I had reviewed. After reading an [article](#) about Shake Light's struggles to compete with larger companies that were essentially selling copies of their design, I realized that I had most likely reviewed an inferior "knock-off", and that would never do...

A couple of weeks later, I had a genuine NightStar LED Flashlight in my hands. Available in clear, solid yellow or black, I was sent the clear model.



As you can imagine, the clear model is perfect for someone like me that enjoys seeing *how* something works. :0)

Specifications:

Temperature: Storage: -50°F (-45°C) to +140°F (60°C) Operation: -40°F (-40°C) to +130°F (55°C)

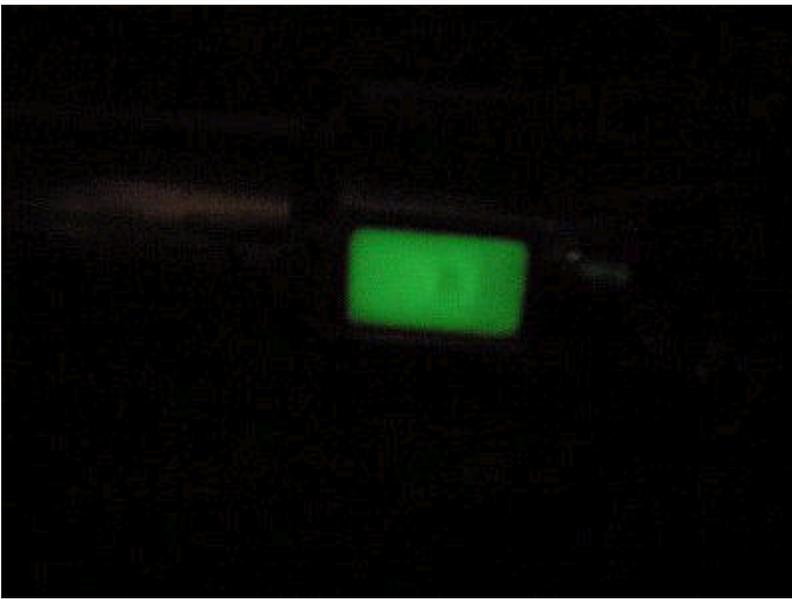
Pressure: Operational at an ocean depth of 180 ft. (55m)

Chemical Resistance: Unaffected by salt water, alcohol, and ammonia based cleaners. Dissolve resistant against medium strength acids.

Shock: Fully functional after repeated random drops from a height of 6 ft (2m) onto a concrete surface.

The NightStar measures 10" long by 2.5" wide at its thicker end, and it weighs 11.1 ounces. The shaft is 1.5" thick, which in hand is a comfortable size. The entire body is composed of a single unit of sealed, slightly textured, clear plastic. This window into the light's "guts" allowed me to immediately see that there were some major interior differences between this light's composition and that of the model I had basically destroyed by [dismantling](#).

First of all, there was no way that I could even perform such exploratory surgery on the NightStar, since I could not find a non-destructive way to crack its case. This lends a bit of credence to ShakeLight's claim of the torch's ability to float and its being waterproof.



The on / off switch is contained in its own glow-in-the-dark sealed receptacle. Close examination of the way that it works reveals that there are *no* wires leaving this chamber.



Instead, there is a small metallic plate on the underside of the switch. A couple millimeters underneath that plate is a raised metal bar. When the switch is in the forward position, the small metal plate is passed directly over the metal bar, which reacts to complete the circuit and turn on the light. Sliding the switch back will then break the circuit and turn off the light. Clever!



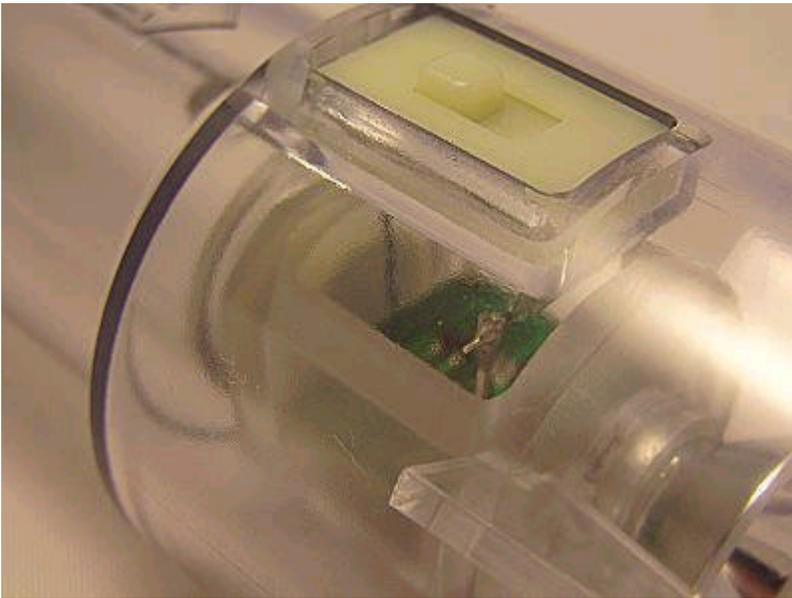
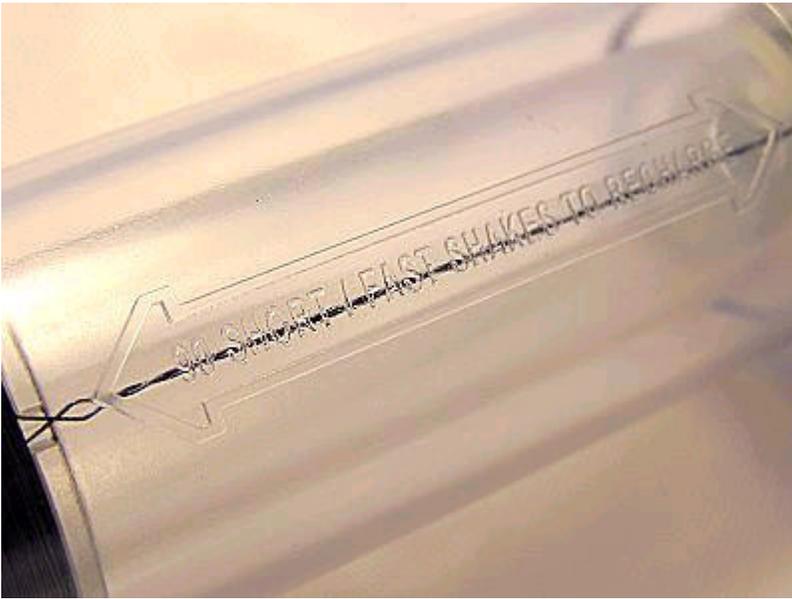


Another major difference between the NightStar and the knock-off is that because of the NightStar's sealed composition there is no need for rubber dampers on either end of the interior magnet. Instead, there are repelling magnets at either end of the shaft which keep the moving magnet from striking the ends. Even with a short burst of quite vigorous shaking I was not able to make the magnet hit either end. This was in stark contrast to the way that the knock-off's magnet would beat on the rubber dampers at each end of its shaft.



The see-through shaft of the NightStar reveals an inner chamber, within which the one inch long magnet moves back and forth. In the center of the shaft, a tightly wound spool of blue colored wire rests, ready to react to the energy generated by the repeated passing of the magnet. The two ends of the

wire meet at the top of the coil, and are then twisted together as they travel to the [circuit board](#) under the bulb area.



The LED end of the NightStar is capped by a blue plastic ring which holds the glass magnifying lens end. This assembly is fused to the plastic sides of the light.



Overall, I am quite impressed with the construction of the NightStar. Without even switching it on, there is a definite feeling of quality. However, its construction is only half of the equation. If the flashlight doesn't work as expected, then it will just be a well constructed paper weight.

In order to build up a charge, the NightStar must be shaken in short burst approximately 90 times. Probably the most effective way to accomplish this, is to bend the arm and shake the light over the shoulder - parallel to the ground. While each shake does not necessarily have to be vigorous, the quicker the shake, the faster the light will charge. According to the [website](#), shaking the light for three minutes will provide a full charge and 10 to 15 minutes of usable light. Because the light will not be fully discharged at this point, shaking the light for 15 more seconds will restore it to a full charge. This sounds pretty impressive, so of course I had to test it out.

First I gave it 90 shakes with my right arm. After deciding that that had been a pretty good mini-workout, I decided to do another 90 with my weaker left arm.

I then switched the light on inside my long dark hallway, and found its beam to be quite bright and strong enough to reach the door at the other end - over 37 feet away. Remember that this is a flashlight with a *single* LED, so while it will not have the incredible brightness of a cluster of four or more LEDs, it is still quite bright and definitely more than sufficient for safe travel through a dark area.

My next test was to lay the flashlight on its side and time the beam, to see if I indeed got at least ten minutes of useable light. As you may recall, the best I could get with the Forever Flashlight was 2.5 minutes of bright light and about two more minutes of dim light before the torch totally died. Using the free [Counter Time](#) program on my Pocket [PC](#), I set the timer for ten minutes and went and did other things. If I returned at ten minutes and the light was still glowing strong, then I would consider the test passed.

When I returned ten minutes later the light was noticeably dimmer (in my brightly lit [office](#)), but once again entering the darkened hallway I found that the light was still bright enough that I could see it on the door at the other end. I consider this test passed with flying colors!

Next, I gave the NightStar 20 brisk shakes, and found that it was indeed just as bright as before. I used the light for the next couple of days, and purposely did not recharge it in between uses. Each time, it would switch on and provide a bright beam for the minute or two that I used it. This in itself was impressive, but I needed to see how the light would do after a serious period of inactivity. So I

recharged it for about thirty shakes and then set it on my desk and left it there - unused for over a month.

Today, I finally picked the NightStar up again, switched it on...and was pleasantly surprised to find that not only did the light come on - it was bright and strong! Needless to say, I was impressed.

Now it was time for some endurance tests!

First on the block were those "waterproof" claims...



A five minute swim in the 100? hot tub did not seem to adversely affect the NightStar, even with the jets on and several purposeful dunkings. As you can see by the picture, the torch floats from its top end, which means that if you truly fear dropping it in water you should probably have a lanyard of some kind attached to its end loop, because there is not much on the surface of the water to grab and the light is highly [mobile](#) with its shaft acting as an underwater sail.

The final test that I performed was the drop test. On the NightStar site, they show a student [throwing](#) the torch at a wall as well as several [videos](#) of assorted [torture tests](#). Each time, the NightStar survives - seemingly undamaged. My test was a bit less radical, yet still effective: I dropped it from our garage apartment's second story balcony onto the ground below - about a 20 foot drop. Not only did the light survive, it didn't appear to have any cosmetic damage.

This is the flashlight that I was hoping for when I first heard that a flashlight could be powered by shaking and this will be the flashlight that I send with my daughter when she goes on her week long [Philmont](#) hike this summer. There will be no fear of her dropping the light, running out of batteries, or any other disaster that might wait the typical light. As an added benefit, the NightStar can act as a compass. Yes, you read that right - when hung horizontally from a tree, the LED end will point due North. With this use in mind, I do wish that a groove had been shaped into the correct location on the light's shaft to better accommodate the string and balance the light. Not everyone will need or appreciate this feature, but I think it is pretty cool!

Of course, there is a downside to a light that uses a powerful magnet as its source of power. The NightStar can not be stored near a [computer hard drive](#) or any other type of media that is adversely affected by magnets. This includes automatic wristwatches, pacemakers and cassette tapes. As long as the user keeps those limitations in mind, there are no other issues that I can see regarding the safe use of this light.

The NightStar is the perfect torch to keep in your disaster kit. There is no need for expensive replacement batteries, and no fear of battery leakage or failure if several years pass before the light is actually called into duty. The peace of mind that is afforded is well worth the already reasonable purchase price.

The ShakeLight NightStar LED Flashlight may be purchased [here](#).

Price: \$39.99

Available in clear, solid yellow and black

Pros:

Never needs batteries

Never needs a new bulb

Will hold a charge for weeks

Waterproof & shockproof

Can be used as a compass

Cons:

Magnets are in use so the NightStar must be kept away from automatic watches, hard drives and pacemakers